CESAJ-EN-C (1110-2-1150a) 2 June 2003

MEMORANDUM FOR RECORD

SUBJECT: EPA - Residential RAD Remediation Order of Magnitude Estimates

1. As requested, estimates for scenarios for the remediation (insulation) of residences for low-level TENORM contamination. These estimates bracket scenarios based on limited information and assumptions from optimistic to conservative.

2. Scope of work. The general scope for remediation services provided were the following assumptions:

a. Each residence ~ 2000 sf with crawl space on ¼ acre lot.
b. Excavate 6" soil below house and replace with concrete.
c. Excavate and replace soil in yard, up to 1000 cy per residence.
d. Assume 500 homes.

3. Costs and support for pricing. The most significant cost item is the offsite transportation and disposal of contaminated soil. The quantity and unit prices account for over 90% of the total cost.

a. The basis for the transportation and disposal costs for the "COE Rates" is an existing USACE contract for disposal of Non-Dept. Of Energy LLW. This contract contains disposal rates for LLW disposal from three of four contractors that have licensed disposal facilities. The rates used in the estimate represent a "least cost" that could reasonably be obtained to perform this service. Note that the PRP cannot use the contract on their own. In order to use the contract, the PRP would likely have to fund EPA, and EPA then fund USACE to administer the contract. The rates are considered valid in that the contractors indicated they would likely charge higher rates to the PRP acting alone. This is due to greater financial risk incurred in dealing with the PRP as opposed to the Government. Disposal facilities are also concerned with

potentially greater administrative burdens. USACE policies and procedures and testing are well established and consistent. These practices may be considerably different than those used by the PRP.

b. The basis for the transportation and disposal costs for the "Non-COE Rates" are prices based on research provided by Mr. Matt Folk CO-CE and Mr. Greg Wagner, CO-CE.

c. The quantity is based on an amount provided by EPA. Any variation in quantity will have a significant impact on the total cost.

4. Cost Risk. This alternative contains significant cost risk in the following areas:

a. Quantities. The potential for "quantity growth" exists any time a large area is involved. A swell factor of 10% was used for the soil.

b. Limited Market / Options for Disposal Facilities. It is our understanding there are only four private companies that handle non-Department of Energy LLW. There were six potential disposal sites identified, one in South Carolina, two in Texas, one in Utah, one in Idaho and one in Washington State. The South Carolina site was determined to be cost-prohibitive since that site specialized in "high-end" LLW. There are several companies that act as "Waste Brokers", where they provide full service disposal options by coordinating the entire offsite operation (transportation and disposal). However, ultimately the waste ends up at one of the six facilities.

c. Price Fluctuations. Prices varied considerably between disposal sites (companies). The prices charged by the companies for storing the waste are subject to change at the discretion of the facilities.

d. State fees and taxes are also included in the disposal cost. These fees are subject to change based on legislation, and not market conditions.

e. Transportation. Due to the large distances involved, fuel costs are significant and are subject to fluctuation.

5. Cost Summary. The table below provides unit costs (remediation per residence(including markups) for different scenarios: (Costs in thousands).

Quantity Variation	COE Rates	Non-COE Rates
Replace 1' Soil in yard (400 loose cubic yards per residence)	$ 300	$ 1,300
Replace 2' Soil in yard (800 loose cubic yards per residence)	$ 525	$ 2,400
Replace 3' Soil in yard (1,100 loose cubic yards per residence)	$ 750	$ 3,500

In this context, replacing 3' of soil per residence and disposing via the COE LLW contract, the total cost for 500 homes would be approximately $ 375,000,000.

6. An additional alternative of constructing the 6" slab under the homes only was considered which eliminates the large cost component of offsite disposal. This reduced offsite disposal from approximately 1,100 cubic yards per residence to approximately 40 cubic yards per residence. Using COE rates, this results in a cost of approximately $ 50,000 per home or $ 25,000,000. Using Non-COE rates, this results in a cost of approximately $ 150,000 per home or $ 75,000,000.

7. Point of contact in Cost Engineering Branch is Mr. Tony DiPiero at 904-232-2030.

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